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UNITED STATES PATENT APPLICATION

of

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for

HANDS-FREE TOOL SUPPORT

BACKGROUND

1. Field of the Invention

5 The present invention relates to tool support apparatus, and more specifically, to apparatus for allowing hands-free support of a tool.

2. Background

10 Workers often require a tool holder to free up their hands for a particular task. This is especially true when the tool is a light source. A reliable source of light is very important when working in confined, dimly lit, or awkward situations. But having a reliable source of light will not provide necessary illumination unless that light is directed properly. There are numerous situations which may require a directed light source. Electricians often find themselves working in confined spaces in a building that may or may not be able to provide electric lighting. Farmers and ranchers may need a light source in the middle of a field, or
15 on a dirt road miles from help. Handymen of all levels of experience require a directed light source in numerous situations around the house where the usual use of electricity may not be advisable or possible. Another common requirement in these situations is that the individual needs to perform some task using both hands, thereby requiring a hands-free directed light source.

20 Numerous devices have been developed to provide a hands-free directed light source. Generally, these devices can be divided into two categories: a complete light source that has been specifically designed for hands-free use; and an attachment that can be attached to a previously existing light source and facilitate hands-free use. Some devices allow attaching an affixed light source to some part of the user's body, allowing the hands to be used for
25 other purposes. These devices may be designed to be attached to the user's hand or wrist while supporting the light source. Other devices supporting a light source are mounted on

the user's head. However, various devices have utilized a foot or even a shoulder to support a light source.

5 The mouth is commonly employed to support a light source, and a variety of light sources and attachments have been developed for such use. Many light sources are designed specifically for use by the mouth. These devices include light sources designed to allow the user to turn the light source on or off with their teeth, or their tongue. They also include light sources shaped to be held by the mouth. These devices are complicated.

10 Other devices are attachments designed for use with a light source, such as a flashlight, facilitating support of the light source by the mouth. These devices are usually designed to be attached to the end of a flashlight allowing the flashlight to be supported by the mouth of the user in a more comfortable manner. These attachments may take the shape of a semi-circle, a stick, or a mouth guard, similar to those used commonly by football players. These add-ons are bulky and not easily stored. Additionally, they prevent the light source from being used with standard light source accessories found in the industry.

15 Each type of hands-free device presents other problems. The devices that are specially designed light sources in and of themselves tend to be cumbersome and complicated. The shape of a light source designed to be mounted to a user's hand, head or shoulder is generally impractical for any other purpose, and difficult to make and to use. They are generally more costly and more likely to break down over time. Light sources
20 designed to be operated by a user's mouth can be complicated and unreliable, being turned off inadvertently and again, impractical for any other use. Attachment devices increase the length and/or width of a light source, and are often awkwardly shaped, and again, impractical for any other use.

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BRIEF SUMMARY OF THE INVENTION

In one embodiment, the tool-holding apparatus is a unitary piece designed to slide onto the body of a tool such as a flashlight. The attachment may slide onto the flashlight in a fully retracted manner, thereby not increasing the length or circumference of the flashlight.

5 The attachment may telescopically slide into an extended position thereby providing a portion of the attachment which may be comfortably supported by the user's mouth, and allowing the user's hands to be used for other purposes.

The tool-holding apparatus may be described as having axial, radial, and circumferential directions. The attachment portion of the tool-holding apparatus may be
10 formed as a cylinder having an inner circumference substantially similar to the outer circumference of the tool. The attachment portion may be made of an elastomeric or semi-rigid material, allowing the attachment portion to deflect and frictionally engage the body of the tool, usually a flashlight. The grip portion of the tool-holding apparatus may be an arcuate segment of the cylinder composing the attachment portion and extending axially
15 away from the attachment portion. The tool-holding apparatus may have a substantially uniform thickness, sharing an outer surface substantially uniformly spaced from the outer surface of the tool. The attachment portion may slidably engage the tool and have a deployed position and a stowed position. The grip portion extends axially beyond and away from the end of the tool while in the deployed position, and is positioned between the two ends of the
20 tool while in the stowed position.

While previous hands-free tools or tool attachments may be considered useful for similar purposes, the hands-free tool-holding apparatus described herein is a more effective and efficient system. Previous tool or flashlight holders change the nature of the tool or light source to such an extent that they are not useful for other purposes and cannot be carried
25 easily. The presently described invention, while in the retracted position generally allows the tool or flashlight to be carried in the usual pocket or pouch and still have the attachment

mounted to the tool. Also, the hands-free tool holder can remain on the tool during normal operation, and quickly and easily provide a portion of the attachment to allow hands-free use.

Thus, it is an advantage of the present invention to provide a tool-holding apparatus that does not substantially change the size or shape of the flashlight when not in use, and can
5 easily telescope into a position where the user can support the tool with their mouth.

It is a further advantage of the present invention to provide such a hands-free flashlight attachment that may be mass produced inexpensively.

BRIEF DESCRIPTION OF THE DRAWINGS

10 The foregoing and other objects and features of the present hands-free tool-holding apparatus will become more fully apparent from the following description and appended claims, taken in conjunction with the accompanying drawings. Understanding that these drawings depict only typical embodiments of the hands-free tool-holding apparatus and are, therefore, not to be considered limiting of its scope, the hands-free tool-holding apparatus
15 will be described with additional specificity and detail through use of the accompanying drawings in which:

Figure 1 is a perspective view of the tool-holding apparatus with a tool shown in phantom;

Figure 2 is a plan side view of the tool-holding apparatus of Figure 1, attached to a
20 tool shown in phantom with the apparatus in a stowed position;

Figure 3 is a plan side view of the tool-holding apparatus of Figure 1, attached to a tool shown in phantom with the apparatus in a deployed position;

Figure 4 is a perspective view of another embodiment of the tool-holding apparatus showing a scoop portion on a grip of the apparatus;

25 Figure 5 is a perspective view of another embodiment of the tool-holding apparatus showing holes, or grip apertures, in a grip of the apparatus; and

Figure 6 is a perspective view of another embodiment of the tool-holding apparatus showing a textured surface on a grip of the apparatus.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

It will be readily understood that the components of the present invention, as generally described and illustrated in the Figures herein, may be arranged and designed in a wide variety of different configurations. Thus, the following more detailed description of the embodiments of the system and method of the present invention, as represented in Figures 1 through 6, is not intended to limit the scope of the invention. The scope of the invention is as broad as claimed herein. The illustrations are merely representative of certain, illustrative embodiments of the invention. Those embodiments of the invention will be best understood by reference to the drawings, wherein like parts are designated by like numerals throughout.

Those of ordinary skill in the art will, of course, appreciate that various modifications to the details of the Figures may easily be made without departing from the essential characteristics of the invention. Thus, the following description of the Figures is intended only by way of example, and simply illustrates certain embodiments consistent with the invention. Figures 1-3 illustrate a flashlight in phantom as the tool used with the tool-holding apparatus. However, the tool-holding apparatus may be used with other suitable tools.

Referring to Figure 1, the apparatus 10 may generally be composed of two sections, an attachment portion or member 20 and a grip portion or grip 22. The attachment member 20 of the apparatus 10 is sized to and allows the apparatus 10 to slide, or telescope, and frictionally engage the outer tool circumference 42, or outer surface of a tool, along a body 44 (or a length) of the tool 40. The attachment member 20 may serve as a clamp on and along the body 44 of the tool 40. The grip 22 may be inserted into the user's mouth to allow the user to support the tool 40 without using any hands.

The attachment member 20, which can also be described as a cylinder 50, has a tubular shape and fits closely to the body 44 of the tool 40. The proximate aperture 36 and the distal aperture 38 comprise a pair of open ends in the attachment member 20. The

proximate end 32 of the apparatus 10 has a proximate aperture 36 through which a first end 48 of the tool 40 may be inserted. The attachment member 20 also defines a distal aperture 38 allowing the tool 40 to essentially slide through the attachment member 20.

The inner circumference 28 of the apparatus 10 is substantially the same as the tool circumference 42 of the body 44 of the tool 40. This similarity in circumferences 28 and 42 allows the attachment member 20 to slide along, or frictionally engage the body 44 of the tool 40. The friction generated by the attachment member 20 is strong enough to resist inadvertent movement of the apparatus 10 with respect to the body 44 of the tool 40, but weak enough to allow insertion of the first end 48 of the tool 40 into the proximate aperture 36 of the apparatus 10.

In Figure 2, a portion of the attachment member 20 has been cut away to illustrate that the apparatus 10 is substantially uniform in thickness. The inner circumference 28, or inner surface 24, of the apparatus 10 is a substantially uniform distance from the outer circumference 30, or outer surface 26, of the apparatus 10. It will be appreciated by those of skill in the art that the configuration minimizes the relief or footprint of the apparatus 10 relative to the tool 40. This allows the tool 40 to be used with any accessories even while the apparatus is attached. In one embodiment, the inner circumference 28 of the apparatus 10 may be uniform from the proximate end 32 to the distal end 34 of the apparatus 10, while the outer circumference 30 of the apparatus 10 changes slightly from the proximate end 32 to the distal end 34 of the apparatus 10, resulting in a tapering of the apparatus 10.

A slit 52 may be cut along the length of the attachment member 20 to allow the attachment member 20 to expand slightly, thereby increasing the inner circumference 28, and facilitating the insertion of the first end 48 of the tool 40 within the attachment member 20. The slit 52 along the length of the attachment member 20 allows the attachment member 20 to elastically deflect and frictionally receive the first end 48 of the tool 40. If a slit 52 is cut along the length of the attachment member 20, the attachment member 20 could be described as composed of two tab members 54. Each tab member 54 providing the necessary friction

to engage the body 44 of the tool 40. Tab members 54 may have alternative embodiments, such as snap tabs or tabs that are spring loaded. It will be appreciated by those of skill in the art that other means for frictionally engaging the tool 40 are available as long as they are capable of providing appropriate elasticity of the attachment member 20 and sufficient friction on the body 44 of the tool 40.

The apparatus 10 may be defined as a cylinder 50 that transitions into an arcuate segment 56. As one proceeds from the proximate end 32 of the apparatus 10 to the distal end 34 of the apparatus, the cylinder 50 is less complete, until the distal end 34 of the apparatus 10 is essentially an arcuate segment 56 of the complete cylinder 50. The attachment member 20 resembles a complete cylinder 50. The attachment member may have a slit 52. The grip 22 is a portion of a cylinder 50, or an arcuate segment 56 of the cylinder 50 extending axially away from the attachment member 20, at the distal end 34 of the apparatus 10.

In one embodiment, the arcuate segment 56 may appear substantially planar, providing a nearly flat surface (as illustrated in Figure 1). The arcuate segment 56 has a slight curve allowing the grip 22 to conform to the body 44 of the tool 40. The grip 22 could be a planar surface, similar to a tongue depressor or popsicle stick, but using an arcuate segment 56 of the original cylinder 50 provides other benefits. A slightly curved grip 22 provides greater rigidity and support, conforms more closely to the body 44 of the tool 40, and makes production of the apparatus 10 easier and cheaper. The greater rigidity and support of the grip 22 may facilitate the distal end 34 of the apparatus 10 being inserted into the ground, allowing the tool 40 to be supported in this alternative manner.

Referring to Figures 2 and 3, the apparatus 10 is configured for slidable engagement along a length of the tool 40, such as the body 44, between a deployed position and a stowed position. Figure 2 shows the apparatus 10 in the stowed position. It is clear from Figure 2 that the apparatus 10 does not extend beyond either the first end 48 of the tool 40, or a second end 46 of the tool 40 while in the stowed position.

Referring to Figure 3, the apparatus 10 is shown in the deployed position. The attachment member 20 of the apparatus 10 slides along the body 44 of the tool 40 extending the grip 22 axially beyond the first end 48 of the tool 40. This allows a user to grasp the grip 22 with the user's mouth, thereby supporting the tool while keeping the user's hands free.

5 It may also be noted that while in the deployed position, the grip 22 may extend axially so far beyond the first end 48 of the tool 40 as to allow the user to support the apparatus 10 between the molars or premolars, as opposed to the incisors, which in some instances, is more comfortable. It will be noted by those of skill in the art that molars and premolars can handle more stress and are generally stronger than incisors. Further, the
10 muscles of mastication tire less easily when a users is biting with molars.

In one embodiment, the apparatus 10 may be a single, homogenous piece of a given material with the attachment member 20 and grip 22 being integral. The material used for the apparatus 10 may be a rigid plastic, a more malleable plastic (having a material memory, or a material capable of flexing, but urging return to its original shape), a hardened rubber,
15 or any material capable of providing the necessary combination of support and flexibility. The single material deflects elastically to provide a force normal to a surface at the inner circumference 28 of the apparatus 10, promoting friction between the body 44 of the tool 40 and the attachment member 20 resisting relative axial motion there between.

The material may also be chosen to reflect very little light, having a matte finish. The
20 material may contain a phosphor, including without limitation, Zinc Sulfide or Strontium Aluminate, thereby causing the apparatus 10 to glow in the dark. Thus, the apparatus 10 can more easily be found during power outages, or when the apparatus 10 is stored in the recesses of back packs, storage belts, or glove compartments.

In another embodiment, the apparatus 10 may be composed of two or more parts.
25 The apparatus 10 could be composed of a rigid portion providing the necessary support and extension component, or grip 22, and a strap or collar composed of a more flexible material

and capable of securing the tool 40 to the apparatus 10 while still allowing telescopic retraction of the rigid portion.

5 In one embodiment, the apparatus 10 does not substantially alter the profile of the tool 40 from any direction while in the stowed position. Therefore, the tool 40 may be used in its usual manner and may be carried in its usual carrier or pouch while the apparatus 10 is mounted on the tool 40 and in the stowed position.

Referring to Figure 4, one embodiment of the present invention is shown with the arcuate segment 56 slightly expanded circumferentially at the distal end 34 of the apparatus 10. The circumferentially expanded areas 23 (best seen in Figures 2 and 3) provide a scoop portion 62 of the apparatus 10. The scoop portion 62 facilitates the use of the distal end 34 of the apparatus 10 as an eating utensil. It will be appreciated that the scoop portion 62 can be configured to still conform closely to the body 44 of the tool 40. Additionally, the size of the expanded areas 23 must be balanced against the ease with which the distal end 34 is placed into a user's mouth.

15 Referring to Figures 5 and 6, one embodiment of the present invention may include a grip 22 having a generally flat surface. However, the surface of the grip 22 may contain grip apertures 58 or a textured surface 60, such as ridges or bumps, allowing better gripping of the grip 22 by the user's mouth, or molars. Figures 5 and 6 show the use of grip apertures 58 and a textured surface 60 on the surface of the grip 22, respectively. It will be appreciated by those of skill in the art that the grip 22 may also be covered with, or made from, a softer material to increase comfort and allow better gripping.

20 The apparatus 10 of the present invention allows a method for manipulating a tool 40 or flashlight 40, by providing an apparatus or flashlight support having a grip 22 and an attachment member 20. The attachment member 20 may be capable of substantially surrounding and frictionally engaging a portion of the flashlight 40. The apparatus 10 or flashlight support may be attached to the flashlight 40 such that the flashlight support 10 is selectively movable along a length of the flashlight 40. The flashlight support may be

selectively moved along the flashlight 40 such that the grip 22 extends away from a first end of the flashlight 40 in an axial direction. The grip 22 may then be positioned in a mouth of a user. The flashlight support may be removed from the mouth of a user and stowing the grip 22 proximate the flashlight between a first end 48 and second end 46 of the flashlight by moving the attachment portion 20 axially along the flashlight toward the second end 46 of the flashlight.

From the above discussion, it will be appreciated that the present hands-free tool or flashlight apparatus provides novel apparatus and methods directed to supporting a flashlight without the use of a user's hands.

The present hands-free flashlight apparatus may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative, and not restrictive. The scope of the invention is, therefore, indicated by the appended claims, rather than by the foregoing description. All changes that come within the meaning and range of equivalency of the claims are to be embraced within their scope.

What is claimed and desired to be secured by United States Letters Patent is: